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HALLIBURTON NUS
Environmental Corporation

DELIVERABLE 438A

SOLAR EVAPORATION PONDS STABILIZATION PROJECT
STANDARD OPERATING INSTRUCTION
CONSOLIDATION, PRETREATMENT, AND RECLAIM
OF SOLAR PONDS AND CLARIFIER

for

EG&G ROCKY FLATS

prepared by

HALLIBURTON NUS ENVIRONMENTAL CORPORATION

REVISION 1

JUNE 15, 1992

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PROCEDURE CONCURRENCE FORM

PLEASE INDICATE CONCURRENCE WITH THE ATTACHED PROCEDURE

PROCEDURE NO. **WBS 438A CONSOLIDATION & PRETREATMENT OF SOLAR PONDS & CLARIFIER**

TITLE: **OPERATING INSTRUCTIONS - LEFCO ENVIRONMENTAL TECHNOLOGY**

Concurrence with the above named procedure is indicated by signature below.

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STANDARD OPERATING INSTRUCTION

CONSOLIDATION, PRETREATMENT, AND RECLAIM OF SOLAR PONDS AND CLARIFIER

I. INTRODUCTION

A. Purpose/Overview

To transfer, consolidate, pretreat, and reclaim the 207A and B series Solar Ponds, to chemically pretreat and reclaim the Clarifier unit, and to homogenize, pretreat, and reclaim the 207C Solar Pond.

The 207A Pond water and sludges will first be transferred to the 207B series Ponds as current capacities allow. EG&G Chemical Operators will continuously wash the remaining residue on the bottom of the A Pond to the sump area for further pumping, and adequate water will be maintained in the 207A Pond to facilitate washdown

Consolidation will take place in conjunction with an evaporation process to be performed by EG&G for the purpose of removing excess water from the Ponds. The 207B North and B Center Ponds will be consolidated in the 207B South Pond when water levels are reduced to the point that the 24 inch freeboard set by EG&G can be maintained. A scalping screen will be placed in line for reduction of all material to minus 10 mesh when the final consolidation is made to B South Pond. The remaining Solar Pond water and sludge will then be pretreated with calcium hypochlorite by an approved method for destruction of pathogens prior to reclaim for introduction into the stabilization process.

The Clarifier unit will be chemically pretreated in-situ by an approved method and reclaimed using the LEFCO "Sludge Buster" boom pumping system. The Sludge Buster is a truck-mounted system capable of reaching the Clarifier from a position west of the 788 building. The sludges will be pumped from the Clarifier to a series of batch tanks where it will be mixed with material from the 207C Pond for processing.

HNUS will homogenize the water in the 207C Pond for the final phase of Pond sampling. Upon completion of this process, LEFCO will use the Sludge Buster and auxiliary systems to continue to aggressively turn the Pond over and homogenize the total contents of the Pond. Oversized particles will be segregated into a box for subsequent disposal during Pondcrete/Saltcrete processing. The Sludge Buster will also be used to reclaim the contents of the 207C Pond. Chemical pretreatment of C Pond material will be accomplished in a contact chamber prior to entry into the stabilization process.

B. Definitions

1) PROJECT: Rocky Flats Solar Pond/Pondcrete Stabilization Project

2) OWNER: U.S. Department of Energy

3) OPERATOR: EG&G Rocky Flats, Inc.

4) GENERAL CONTRACTOR: Halliburton NUS Environmental Corporation

5) SUBCONTRACTOR: LEFCO Environmental Technology

C. Abbreviations

1) DOE: U.S. Department of Energy

2) LEFCO: LEFCO Environmental Technology, subcontractor to Halliburton NUS Environmental Corporation for consolidation and pretreatment of the Solar Ponds and Clarifier.

3) HNUS: Halliburton NUS Environmental Corporation

4) RFP: Rocky Flats Plant

5) WS: EG&G Waste Solidification Department

6) POD: Plan Of the Day meeting

D. Personnel Requirements and Duties

All Solar Pond personnel are required to have an RFP active respirator fit certification and 207A, B, and C Pond indoctrination. Personnel must meet the minimum training and medical monitoring requirements specified in 29 CFR Part 1910.120. Personnel must have DOE "Q" clearance or prior arrangements for an escort must be made. Specific requirements and duties are listed in the Individual Operating Instruction portion (Section II.) of this document.

E. Related Documents

1) Site-specific Quality Assurance Plan (Deliverable No. 730)

2) Applicable Process Control Plan (Deliverable No. 251, 252)

3) Health and Safety Plan (Deliverable No. 750C), and Job Safety Analysis for Consolidation and Reclaim of Solar Evaporation Ponds.

4) Technical Equipment Operation Manuals

F. Required Equipment

EG&G will provide locker facilities for HNUS and LEFCO personnel. Required operational equipment for each phase of work is listed in the Individual Operating Instruction portion (Section II.) of this document. Required health and safety equipment for all phases is per table in Attachment 1, Typical PPE Dress-Out Procedure.

G. Preliminary Arrangements

Pond Safety

Field personnel will receive Solar Pond safety training and review Pond procedures prior to initiating operations. Pond safety is discussed in detail in the Health and Safety Plan and the Job Safety Analysis for Consolidation and Reclaim of Solar Evaporation Ponds.

EG&G Logistical Support

The Waste Solidification Department will be responsible for scheduling and ensuring the availability of EG&G personnel and equipment. EG&G will be responsible for providing support personnel for Pond operations, and for coordinating the on-site transportation and storage of LEFCO equipment at designated staging areas. HNUS and LEFCO supervisory personnel will attend daily WS POD meeting to be apprised of the specific activities planned for the day and to achieve the necessary coordination in scheduling HNUS/LEFCO work.

Pre-evolution

Before commencement of daily operations, a "pre-evolution" briefing will be held in T750G or T788A. All personnel will be advised of daily operations and health and safety issues, and sign off on a Radiological/H&S Work Permit form (RF-13010) daily. All personnel involved in the transfer and consolidation process are required to wear appropriate EG&G protective clothing.

Corrective Action

Corrective action will be accomplished in accordance with Section QAP-16 of the Site-specific Quality Assurance Plan (Deliverable No. 730).

Health and Safety

In accordance with the Health and Safety Plan (Deliverable No. 750C) and the Job Safety Analysis for Consolidation and Reclaim of Solar Evaporation Ponds.

H. Initial Conditions

(Refer to Individual Operating Instruction - Section II)

I. Record Keeping

1) The LEFCO superintendent will be responsible for keeping the following records: job tickets, hourly personnel logs, equipment maintenance needs, and daily system inspection reports.

2) HNUS will be responsible for keeping the following records: (Refer to Individual Operating Instruction - Section II)

J. Demobilization

Demobilization of LEFCO equipment will occur following complete decontamination and certification that the equipment is clean and acceptable for removal from the work area. Demobilization to the 130 Warehouse will require the equipment and personnel described in Section II. A. Equipment will be shipped from the RFP by common carrier identified by LEFCO management.

II. INDIVIDUAL OPERATING INSTRUCTION FOR EACH FUNCTION TO BE PERFORMED IN THE PROCESS

A. Transfer 207A Pond Water and Sludge To 207B Series Ponds

Personnel Requirements and Duties

1) EG&G Plant Contacts: EG&G Waste Solidification Department

2) Escorts: 1 for every 3 red-badged personnel

3) LEFCO Personnel

3.1 Superintendent: (1) To provide oversight for all phases of operation, including maintenance of equipment and record keeping.

3.2 Pump Operator: (1) Located at the air compressor and air diaphragm pump to assure proper operation of equipment and immediate shutdown if circumstances require.

3.3 Discharge Manifold Operator: (1) Stationed at the discharge piping to evaluate pond levels and to open and close manifold valves as necessary for proper distribution of water and sludges from the 207A to the 207B Ponds.

4) EG&G Equipment Operators

4.1 Fork Lift Operator: (1) Assist in mobilization, setup, testing, and positioning of LEFCO equipment and piping.

4.2 Small Crane Operator: (1) Assist in unloading of LEFCO equipment and piping from common carrier.

4.3 Pickup Truck Driver: (1) Movement of equipment and materials from the 130 Warehouse to the staging area near the Solar Ponds.

5) EG&G Radiological Protection Technician (RPT): (1) Monitor consolidation operations and decontamination of equipment and Pond liners for radiation.

6) EG&G Chemical Operator Support

6.1 Chemical Operators: (2) Assist LEFCO personnel in the mobilization, setup, testing, and positioning of equipment and piping.

6.2 Chemical Operators: (6-12 as required) Assist LEFCO personnel in transfer and consolidation of Ponds, decontamination of equipment. Wash residue remaining in bottom of Ponds to sump areas for further pumping. Decontaminate Pond liners and berms.

Health and Safety Equipment

(Refer to Attachment 1, Typical PPE Dress-Out Procedure)

Required Equipment

These items indicated with an asterisk are to be provided by EG&G. No asterisk indicates items to be provided by LEFCO.

Fork lift*
Small Crane*
Pickup truck*
LEFCO hydraulic power unit (backup)
Caterpillar electrical generator (backup)
Ingersoll/Rand air compressor
Toya 4" hydraulic submersible centrifugal pump (backup)
Wilden 3" air diaphragm pump
LEFCO W85 vacuum pump trailer (backup)
HEPA filtration for vacuum pump trailer (backup)
Flexible 3" x 50' suction hose
Metal 8" perforated filter screen
Flexible 3" x 50' discharge hose
Victaulic 3" x 4" adapters
Victaulic 4" x 10' schedule 40 seamless steel discharge pipe
Victaulic 4" #77 pipe clamps
Victaulic 4" nitrile pipe gaskets
Victaulic 4" manifold valves
Standard 8" x 20' lay-flat PVC double containment hose
Standard 8" x 20' schedule 40 PVC double containment pipe
Equipment trailer

Initial Conditions

LEFCO equipment will arrive at the Rocky Flats Plant by common carrier. The equipment will initially be unloaded at the 130 Warehouse, then moved to a designated area on the 904 Pad using the EG&G provided fork lift, crane, equipment operators, and two labor assistants. Baseline radiological surveys will be performed on all LEFCO equipment prior to leaving the 904 Pad for the Solar Ponds.

LEFCO equipment and piping will be mobilized to a staging area near the 207A and B Solar Ponds using the fork lift, pickup truck, and appropriate EG&G personnel (2 equipment operators and 2 labor assistants). The staging area will be located at the northeast corner of the 207A Pond and will be of sufficient size to accommodate the air compressor and air diaphragm pump, and to allow the assembly of the various pieces of piping and the pump. LEFCO will have a small equipment trailer for spare parts at the site and will need to have a space designated where it can be parked. A vacuum trailer, hydraulic power unit, and hydraulic submersible pump will be held in reserve as a backup pumping system in the event that the primary system is inadequate to remove the material from the Ponds. Space will be required on either the 904 Pad or in the Solar Pond area for equipment storage.

The set-up of equipment will take place under the initiation and supervision of HNUS and EG&G. The piping will be assembled first, followed by the pumping equipment. EG&G will place the assembled components in their proper positions at the direction of LEFCO personnel (see Attachment 2). The flexible rubber suction hose will be placed in the A Pond sump and connected to the air diaphragm pump, located on the berm. The air compressor will be placed near the pump, and an air supply line attached. The flexible discharge hose will connect the pump to the discharge manifold along the western edge of the B series Ponds. The pipe manifold will have a short discharge pipe and ball valve located in the sump of each B Pond for distribution of water and sludge as required. Downstream of each discharge pipe will be a ball valve for checking the flow of slurry to the far end of the pipe. Ball valves will be tagged with numbers 1 through 5 as shown in Attachment 2 (Diagrams of Piping and Manifold System for Consolidation of 207A and B Ponds). Double containment will be an 8" flexible PVC hose for the pipe that runs from A Pond to B North, and 8" schedule 40 PVC pipe will be in place where piping crosses the berms separating the B Ponds.

The steel piping manifold within the confines of the B Ponds may not be able to be placed on-grade without the pipe system tending to roll toward the Ponds. If this occurs, the existing concrete barricades and cable configuration will be used to support the piping within the Ponds. The piping weighs 14.7 pounds per foot when filled with slurry, and it is anticipated that 150 pound bollards placed every 10 feet will be sufficient to secure the pipe. Double containment piping will be minimized using this system.

The assembled sections of hose and pipe will be hydro-tested using city water pressure. This will be accomplished by filling the piping section from the low point (to purge air from the system) with an adapter end cap having a garden hose attachment or an air hose crow's foot connection. Once the pipe has been filled, an end

cap will be clamped in place. Water pressure will then be applied and the piping inspected. If higher pressure is required for testing, the air diaphragm pump will be placed in the system to develop the increased pressure. Water used for testing will be drained from the system and disposed of by EG&G.

Record Keeping

HNUS will be responsible for keeping the following records:

1) Field Journal

2) Copies of Verification Form for Positioning of Manifold Valves (Attachment 3)

Operating Instruction

1) Dress in EG&G provided undergarments and coveralls. Conduct pre-evolution health and safety brief at T750G or T788A to discuss specific activities to be performed that day. Management and supervisory personnel attend POD meeting.

2) Assigned Pond transfer and consolidation personnel don personal protective equipment as prescribed in the Health and Safety Plan, and the Job Safety Analysis for Consolidation and Reclaim of Solar Evaporation Ponds, and enter the Pond area to begin the day's activities.

3) Mobilize to staging area located near northeast corner of Solar Pond 207A.

4) Current B Pond volumes dictate which Ponds have available space, and EG&G management personnel instruct LEFCO superintendent as to which B Pond(s) receives slurry material from the A Pond.

5) The pump, discharge manifold, and series of 5 ball valves are arranged in the configuration shown in Attachment 2.

6) Connect the 3" flexible suction and discharge hoses, and the air supply line from the compressor, to the air diaphragm pump located on the Pond berm.

7) Place the suction hose with the metal 8" perforated filter screen in the A Pond sump area.

8) Valves 1, 3, and 5 control flow entering Ponds B North, B Center, and B South, respectively.

9) To pump material only to the B North Pond, Valve 1 is opened and Valves 2, 3, 4, and 5 are closed.

10) To pump material simultaneously to B North and B Center Ponds, Valves 1, 2, and 3 are opened and Valves 4 and 5 are closed.

11) To pump material to all B Ponds, all 5 valves are opened.

12a) Any combination of Ponds can receive material simultaneously. This is accomplished by opening or closing the valves (Valves 1, 3, and 5) located on the short discharge pipes for control of flow to the respective Ponds, and opening the in-line valves (Valves 2 and 4) between the pump and the Ponds that are to receive the material.

12b) At least one valve will be open, in accordance with Attachment 3, to insure that a high head pressure will not be achieved during pumping startup, and to reduce the potential of a ruptured hose or pipe.

13) Place series of manifold ball valves in open or closed positions prescribed by EG&G WS supervisor. HNUS and EG&G WS supervisors verify all ball valve settings and sign and date Verification Form For Positioning Of Manifold Valves (Attachment 3).

14) Set diesel engine on air compressor to operating rpm.

15) WS supervisor notifies LEFCO pump operator to begin pumping. Pump operator opens and adjusts ball valve on air compressor outlet to start operation of air diaphragm pump at required pumping rate.

16) Pump until mechanical problems are encountered or Pond volumes reach the level where a change in valve line-up is required. Discharge manifold operator signals pump operator to cease operation, and ball valve on air compressor is closed. When pump stops, pump operator will signal to discharge manifold operator to open vent valve on piping, and discharge piping is drained.

17) If filter screen is obstructed, clear blockage by swirling end of suction hose in water. If this fails, pull pipe to bank and physically remove obstruction.

18) The pump and piping system will be inspected on a continual basis by both LEFCO and WS supervisors. When leaks are detected, system will be shut down immediately per step 16 of this Operating Instruction. Any material that has been spilled will be cleaned up by an approved method, and the leakage will be corrected before operation continues.

19) Radiological Protection Technicians will perform periodic surveys, and decontamination will be performed as required.

20) All five valves, shown on Attachment 3, will be closed each day after the pump has been shut down and pumping operations are completed for the day.

21) Completion of part or all of the A Pond to B Pond transfer will enable equipment to be dismantled, moved, removed, decontaminated, or a combination of the above. Initial decontamination of the pump and piping system will be performed as directed by EG&G. Equipment that cannot be decontaminated satisfactorily will be replaced.

Casualty Procedures

For any abnormal situation, including situations noted in Section III., the equipment operators should shut down the pumping equipment by closing the ball valve on the air compressor outlet, and closing manifold valves 1 through 5 if time/situation permits.

B. Consolidate 207B North and Center Ponds to 207B South Pond (Includes Chemical Pretreatment)

(To be provided)

C. Reclaim 207B Pond Water and Sludge

(To be provided)

D. Chemical Pretreatment of Clarifier Unit

(To be provided)

E. Reclaim Clarifier Unit

(To be provided)

F. Homogenize 207C Pond

(To be provided)

G. Reclaim 207C Pond (Includes Chemical Pretreatment)

(To be provided)

III. CASUALTY PROCEDURES FOR EACH MAJOR ADVERSE CONDITION

A. General Adverse Conditions

Responses for the following emergency situations are defined in Section 13 of the Health and Safety Plan for Solar Ponds Area:

1) Medical Emergencies

2) Spills

3) Fires and Explosions

4) High Winds

B. Equipment Malfunctions

Unique responses for equipment casualties are defined in Section II. - Individual Operating Instruction.

ATTACHMENT 1

TYPICAL PPE DRESS-OUT PROCEDURE

	PPE LEVEL		
	D	MOD. D	C
• Don EG&G gray coveralls (and underwear, if needed), and safety shoes or boots	X	X	X
• Don boot covers		X	X
• Don safety glasses and hard hat (if needed)	X[2]	X[2]	X[2]
• Obtain chemical resistant outer gloves for wet product handling, or double surgical gloves for dry product handling[3]		X	X
• Don Saranex or Tyvek overalls as necessary and two pairs of surgical gloves		X	X
• Tape outer surgical glove to Saranex or Tyvek coveralls		X	X
• Tape Saranex or Tyvek to Oak Ridge (plastic) boot covers		X	X
• Don respirator			X
• Don cotton hood			X
• Tape respirator/hood interface			X
• Check respirator fit			X
• Tape outer gloves to Saranex or Tyvek		X[1]	X
• Chemical Resistant Goggles and Face Shield		X	
• Leather Gloves		X	

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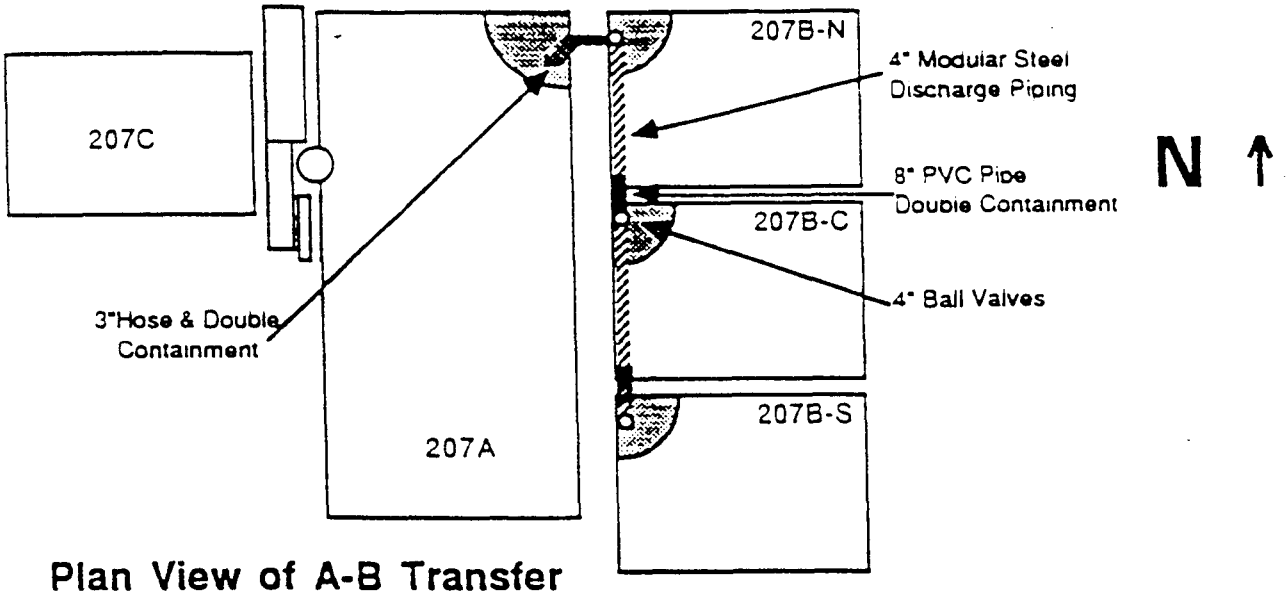
1 As required when assisting personnel in decontamination, or as specified in OSA or JSA.

2 This requirement for safety glasses may be waived when full-face respirators are worn; and for hard hats when head protection is not needed.

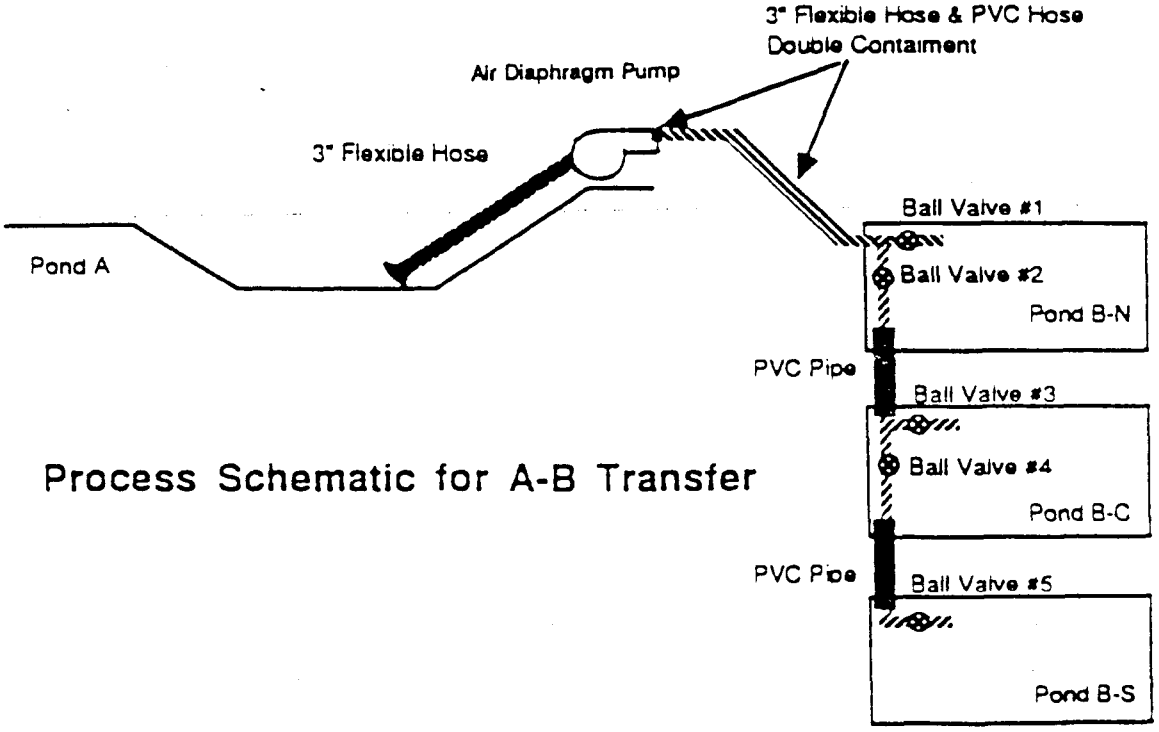
3 Glove choices may include Viton, Nitrile, Polyvinyl chloride, Butyl, or Neoprene. If the weather is cold, Butyl and Neoprene are better choices.

ATTACHMENT 2

DIAGRAMS OF PIPING AND MANIFOLD SYSTEM
for
CONSOLIDATION OF 207A AND B PONDS



Plan View of A-B Transfer



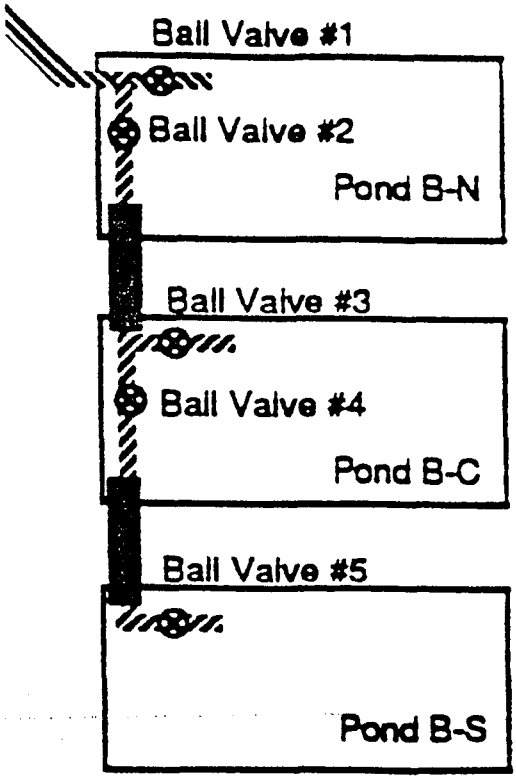
Process Schematic for A-B Transfer

ATTACHMENT 3

VERIFICATION FORM FOR POSITIONING

OF MANIFOLD VALVES

N ↑



VALVE LINEUP	
Valve #	Position (Open or Closed)
1	
2	
3	
4	
5	

Valve Lineup for: _____
Date

from _____ to _____
Time Time

Verified by: _____ _____ _____
HNUS or LEFCO Date Time

_____ _____ _____
WS OPS MGR Date Time

Distribution: EG&G WS
HNUS
LEFCO